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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,059	03/17/2004	Toshiya Nakayama	TAM-049	1695

20374 7590 11/28/2005

KUBOVCIK & KUBOVCIK  
SUITE 710  
900 17TH STREET NW  
WASHINGTON, DC 20006

EXAMINER

COSTALES, SHRUTI S

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 11/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/802,059	NAKAYAMA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Shruti S. Costales	1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 October 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2 and 4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. All outstanding rejections and objections except for those described below are overcome by applicants' amendment filed October 5, 2005.
2. Upon consideration applicant's arguments, the rejections set forth in the action mailed July 5, 2005 have been reconsidered and the following new grounds of rejection have been set forth below in paragraphs 4-6. Accordingly, the following action is **NON-FINAL**.

### *Claim Rejections - 35 USC § 103*

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Massengale (U.S. Patent Number 5,686,521) in view of Takagi et al. (U.S. Pre-Grant Publication Number 2003/0130405).

Massengale discloses milled carbon fiber reinforced polymer and articles fabricated therefrom for use in the semiconductor processing field such as for the preparation of semiconductor wafer cassettes and/or wafer transport boxes (Col. 1, lines 9-11 and Col. 2, lines 56-62). It is to be noted that fibrils, as recited in the presently cited claims, are a type of fibers. Polyolefins or polyamides may be used as base resins, including polyetheretherketone (PEEK) (Col. 3, lines 7-20). As

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Massengale and the presently cited claims name at least one common resin, namely the polyetheretherketone, the melting temperature of the resin would inherently be at least 300° C as recited in the presently cited claims. Massengale also discloses a static decay of <2 seconds measured in a range of +5KV-5KV (Tables I and II shown in Cols. 7 and 8). The base resin is present in an amount between 66 – 81% by weight of the working composite material (Col. 3, lines 52-55). The milled carbon fibers are present in an amount between 19% to 34% by weight of the working composite material (Col. 4, lines 15-19).

The difference between Massengale and the presently claimed invention is the requirement that the carbon fibril has specified dimensions.

Takagi, which is drawn to IC chips use for semiconductors and wafers (Page 1, paragraphs [0001]-[0003]), discloses carbon fibrils having an outer diameter of 15 nm, an inner diameter of 5nm and a length of 100 to 10,000 nm (Page 7, paragraph [0081]). It is to be noted that the outer diameter and length disclosed by Takagi can be used to calculate the aspect ratio ( $l/w$ ) which is 6.67 to 666.67. It would have been obvious to one of ordinary skill in the art to substitute Takagi's specific carbon fibrils with Massengale's carbon fibers because the resulting composition will exhibit improved volume resistivity and electrostatic properties (Page 1, paragraphs [0007]-[0012]), thereby obtaining the invention as set forth in the presently cited claims.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Massengale in view of Takagi as applied to claims 1 and 2 above, and further in view of Kinoshita et al. (U.S. Pre-Grant Publication Number 2002/0139961).

The difference between the presently claimed invention and Massengale in view of Takagi is the requirement that other synthetic resins such as polyetherimide or polyethersulfone are used.

Kinoshita discloses super engineering plastics such as polyethersulfone and polyetherimide in addition to polyetheretherketone (Page 7, paragraph [0126]) for use in a substrate for electronic circuitry (Page 7, paragraph [0118]). It would have been obvious to one of ordinary skill in the art to use Kinoshita's listed super engineering plastics in Massengale's carbon fiber reinforced polymer and articles fabricated therefrom because these super engineering plastics have electroconductive properties (Page 7, paragraph [0119] and [0126]) rendering the semiconductor wafer carriers useful for transport and storage capabilities as electrostatic charges can be dissipated by these electroconductive super engineering plastics, thereby obtaining the invention as set forth in the presently cited claim.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Massengale in view Takagi as applied to claims 1 and 2 above, and further in view of Kubotera et al. (U.S. Patent Number 6,540,945).

The difference between Massengale in view of Takagi and the presently claimed invention is the requirement that milled carbon fibers are added to the reinforced polymers in an amount of about 0.99 to 9.09 wt% (calculated by assuming the total weight of the composition to be in the range of from 101 [1 part carbon fibrils + 100 parts resin] to 110 [10 parts carbon fibrils + 100 parts resin]).

Kubotera discloses adding carbon fibers to resin for making chip carriers (Col. 1, lines 14-20) in an amount of from 5 to 50% by weight of the resin (Col. 3, lines 14-20). It would have been obvious to one skilled in the art to add a broad ranging amount of carbon fibers to the resin of Massengale because the carbon fibers facilitate dissipation of static charges and provide enhanced electromagnetic shielding (Col. 1, lines 30-61 and Table 1), thereby obtaining the invention as set forth in the presently cited claim.

### ***Response to Arguments***

7. Applicants' arguments filed on October 5 have been fully considered but they are not persuasive.

Specifically, applicants argue that Massengale fails to disclose a carbon fibril having an average diameter of 3.5 to 75 nm and that the examples of the present invention show improved properties when using carbon fibrils having an inner diameter of 5 nm as opposed to carbon fibers having an average fiber diameter of 10,000 nm.

It is to be noted that Massengale discloses carbon fiber reinforced polymer and articles fabricated therefrom for use in the semiconductor processing field such as for the preparation of semiconductor wafer cassettes and/or wafer transport boxes (Col. 1,

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lines 9-11 and Col. 2, lines 56-62). Takagi discloses carbon fibrils having an outer diameter of 15 nm, an inner diameter of 5nm and a length of 100 to 10,000 nm (Page 7, paragraph [0081]). It would have been obvious to one of ordinary skill in the art to substitute Takagi's specific carbon fibrils with Massengale's carbon fibers because the resulting composition will exhibit improved volume resistivity and electrostatic properties (Page 1, paragraphs [0007]-[0012]), as disclosed in the presently claimed invention.

Moreover, the composition of Massengale in view of Takagi will exhibit comparable properties as shown in the Examples of the present invention because the carbon fibril used in the composition of Massengale in view of Takagi has an inner diameter of 5 nm which is the same diameter as the carbon fibril used in the Examples of the present invention.

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shruti S. Costales whose telephone number is (571) 272-8389. The examiner can normally be reached on Monday - Friday, 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*SSC*  
Shruti S. Costales  
November 21, 2005

*Vasu Jagannathan*  
VASU JAGANNATHAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700